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erties from any of the known rare earths, and possessing an atomic weight of about 98 or 99. An element of this atomic weight and with the properties the author describes could not find a place in the periodic system. Mendeléef's eka-manganese would have this atomic weight, but its properties would be very different from those of the new element. The author hence considers the element may not be a simple substance.

J. R. RYDBERG has made further study of the gas evolved from cleveite, and confirms the view of Ramsay that helium is a mixture of two gases. This conclusion is reached from a study of the spectrum of helium.

A FURTHER study of the amount of argon in the atmosphere has been made by Schloesing, in which a remarkable uniformity appears in air from different sources. The average value is found to be 1.184 per cent. of the total volume of nitrogen and argon.

A STUDY of the heat of formation of lithium hydrid by Guntz gives a value of 21.6 calories, a magnitude which might be expected from the great stability of this hydrid. Its dissociation tension at its melting point, 680°, is about 27 mm. J. L. H.

#### ASTRONOMICAL NOTES.

THE Astronomical Society of the Pacific will publish shortly an interesting account of observations of the eclipse of last August. This eclipse was successfully observed in Lappland, whither an expedition had been sent by the Russian Astronomical Society. An account of the expedition, to be published by the Astronomical Society of the Pacific, has been written by M. Rydzewski, one of the members of the expedition, and will be accompanied with reproductions of several very good photographs of the corona obtained during totality.

THE Academy of Sciences of St. Louis has published a paper on Flexure of Telescopes by Prof. M. Updegraff, of the University of Missouri. The question is treated from a theoretical standpoint. The author points out that the small systematic errors which are often found in the results of declination measures with meridian circles may be the effects of 'unsymmetrical action of gravity on the telescope tube.' H. J.

#### SCIENTIFIC NOTES AND NEWS.

##### THE DECIMAL DIVISION OF TIME AND ANGLES.

THE *Revue Scientifique* for October 31st contains an article by M. J. de Rey Pailhade, advocating the introduction of the decimal system in the measurement of time and of angles. The author states that attention was first attracted to this subject when the metric system of weights and measures was introduced into France. Laplace and Poisson made use of the plan proposed at that time, and one measurement, the 'grade' ( $\frac{1}{100}$  part of  $\frac{1}{4}$  circle), is still in use in the Geographical Survey of the French army. The subject was discussed before the Paris Academy, in 1870, by MM. d'Abbadie, Yvon Villarceau and Wolf, but was not again brought prominently forward till 1893, when it was taken up by M. Pailhade in a paper read before the *Congrès des sociétés françaises de géographie* at Tours. Since then other scientific societies have recommended the serious study of the question by men of science. Among these may be mentioned the Association française pour l'avancement des sciences, the Société astronomique de France, the Société de topographie de France and the International Congress of Geography held in London in 1895.

All those who are engaged in making elaborate calculations would reap, it is claimed, great benefit from the system. Not only would the time required in computing results be very much shorter, but the chance of error would be greatly decreased. Men of science chiefly, therefore, should be interested in this reform, for though it would also benefit the general public it would do so in a less degree. M. Pailhade lays stress on the fact that the system can only be introduced very gradually, and

considers that the only advance that is possible or desirable at present is to decide on the system which, while meeting the needs of men of science would be most acceptable to the general public, and to deliberate on the best means of bringing it into general use.

M. Pailhade proposes (1) that the day should be divided into 100 parts (centijours abbreviated *cés*) and subdivided into *décicés*, *centicés*, *millicés* and *dimicés*, (2) that the circle should be divided into 100 *cirs* and subdivided into *décicirs*, *centicirs*, *millicirs* and *dimicirs*. The author dwells at length on the simplicity and other advantages of his plan; he finds that it is easily understood by children and advocates its use in schools. In order to facilitate its introduction into general use he has caused a watch to be made in which the figures of the inner circle are those of an ordinary watch, while two outer circles give the decimal division of time.

#### A TROPICAL BOTANICAL GARDEN.

PROF. D. T. MACDOUGAL contributes to the current number of *Appleton's Popular Science Monthly* an article on Botanic Gardens. He reviews the origin of botanic gardens and describes several of the more important gardens of the world. He calls attention to the need of a botanical garden in the West Indies. The study of living plants has been in large measure confined to those growing between the parallels of 40° and 45° or cultivated under artificial conditions in gardens and conservatories. Prof. MacDougal concludes:

"The centers of botanical activity in Europe are so far removed from the tropical flora that only occasionally does a Transatlantic investigator find time and opportunity to extend his researches to include normal tropical forms. To do this he must visit Buitenzorg or some other garden nearly half way round the world.

"The center of botanical activity in America has at its very doors a tropical region (in the West Indies), unsurpassed in every feature, which may be reached in four or five days from any important city in the country. The establishment of a laboratory and garden in any convenient locality would not only be of untold value in the general development of botan-

ical science, but it would place within easy reach of the investigator or graduate student in American universities facilities unequaled by that of any other country.

"The European botanist would also find a laboratory in the American tropics much more easily accessible than those of the antipodes. The foundation of such an institution would be of direct benefit to the greater number of active botanists, and would go far toward making America the scene of the greatest development of the biology of one of the two great groups of living organisms."

#### GENERAL.

THE Society of American Naturalists will meet at Boston and Cambridge, Mass., on Tuesday and Wednesday, December 29th and 30th. The President, Prof. W. B. Scott, will make an address, and at least one lecture will be given. There will be a discussion on the 'Inheritance of Acquired Characteristics,' in which zoology, botany, paleontology and psychology will be represented. Further details will be given next week. The Secretary of the Society is Prof. H. C. Bumpus, Brown University, Providence, R. I.

THE American Physiological Society will hold its ninth annual meeting at the same time and place as the Naturalists, the first day's session being held at the Harvard Medical School, the second day's session at Harvard University. The headquarters of the Society will be at the Hotel Brunswick. Those who will require apparatus or other necessities for the making of demonstrations may communicate with Dr. H. P. Bowditch, Harvard Medical School. The reading of papers is confined to members of the Society and to guests specially invited by the President and Secretary jointly, and papers are limited to a length of twenty minutes. At the meeting arrangements will be made regarding the joint public discussion with the Association of American Physicians at the Medical Congress of May, 1897, upon 'The Internal Secretion of Glands.' Prof. R. H. Chittenden is President of the Society, and Prof. Frederic S. Lee, Columbia University, New York, is Secretary.

THE American Psychological Association will also meet at the same time and place as the Naturalists and will join them in the discussion on the 'Inheritance of Acquired Characteristics,' and at the dinner on Wednesday. Prof. G. S. Fullerton, the President of the Society, will make an address on Wednesday afternoon, and the Committee on Mental and Physical Tests will make a report, which will be discussed by members of the Society. The Secretary is Dr. Livingston Farrand, Columbia University, New York.

THE American Morphological Society also meets in conjunction with the Naturalists.

THE Geological Society of America meets at Washington, D. C., December 29th to 31st, under the Presidency of Prof. Joseph Le Conte. Prof. H. L. Fairchild, Rochester, New York., is the Secretary.

AN informal conference of members of Section H, Anthropology, of the American Association for the Advancement of Science will be held at Columbia University, New York, at 10 a. m., on December 30th, for the special purpose of discussing the future work and interests of the Section, and to consider the expediency of recommending to the A. A. A. S. the holding of winter meetings of Section H. To facilitate the work of the conference, provision has been made for a few papers. 'The Scope of Anthropology,' and 'The Relations between Anthropology and the other Sciences,' will be treated; and it is earnestly requested that members of Section H contemplating attendance will prepare to participate in the discussion of these subjects either formally or informally. The conference will immediately follow the regular annual meeting of the American Folk-Lore Society, which will be held on December 29th at the same place.

THE New York State Science Teachers' Association will hold its first annual meeting at Syracuse, N. Y., December 29th to 31st. The President, Prof. S. H. Gage, will present a paper on the purpose of the Association and the work it hopes to accomplish, and special discussions have been arranged on the teaching of physics and chemistry, of physical geography and geology, and of botany, zoology and physiology.

The Association was organized in July during the Buffalo meeting of the National Educational Association, and is intended to unite all teachers of science, from those of the secondary schools to university professors, in order to secure mutual acquaintance and helpfulness. All teachers of science are urged to attend the meeting at Syracuse, which immediately follows that of the Associated Academic Principals of the State.

A BRITISH Association for Child Study has been organized, and has held its first meeting at Newcastle-on-Tyne, under the Presidency of Dr. Oliver.

THE proceedings of the sixth annual meeting of the German Zoological Society, which was held at Bonn, from the 28th to the 30th of May of the present year, has been published by W. Engelmann, Leipzig. It is edited by Prof. J. W. Spengel and contains 210 large pages.

THE Natural Science Association of Staten Island held its sixteenth annual meeting on November 14th. The Secretary reported that the number of active members was 85, an increase of 8 over last year, and the Curator reported a number of additions to the collections and to the library. The officers of the preceding year were re-elected, viz: President, Walter C. Kerr; Secretary, Arthur Hollick; Treasurer, Thomas Craig; Curator, H. Cleaver Brown; Trustee, Wm. T. Davis. The Association has accomplished an admirable work in studying the fauna, flora, antiquities and natural phenomena of Staten Island. Interest in science and the progress of science would be greatly forwarded by the formation of similar societies in other places.

A MEETING of the Committee for the Promotion of Agriculture in New York State was held in the house of Mr. A. S. Hewitt, New York, on December 2d. Mr. George T. Powell made a report regarding the work in Westchester county under the auspices of the committee and that accomplished by Cornell University.

THERE is on exhibition at the American Art Galleries, New York, a collection of butterflies made by Mr. S. W. Denton containing 1300 varieties. The collection has been arranged for

artistic rather than for scientific purposes. The collection is for sale, and if not sold in New York will be exhibited in London.

THE Berlin Academy of Science has granted 1000 M. to Prof. Maximilian Kurtze, of Thorn, for a History of Geometry in the Middle Ages.

THE Columbia Historical Society, Washington, D. C., held a memorial meeting on December 7th in honor of Joseph Meredith Toner, George Brown Goode and Kate Field, all of whom were charter members of the Society.

THE *British Medical Journal* states that a statue to Darwin will be erected in Shrewsbury, his native town, by the Shropshire Horticultural Society, at a cost of from \$5,000 to \$6,000.

*Die Natur* gives an account of two monuments recently unveiled in Germany. A monument to Stephen Ludwig Jacobi, the discoverer of the artificial culture of fishes, was unveiled at Hohenhausen on July 4th. Jacobi was born in 1711, and published, in 1765, an account of the experiments he had made. A monument to K. A. Lossen, the geologist, especially known for his investigation of the Harz region, was unveiled at Wernigerode on October 19th.

WE learn from *Nature* that a monument in memory of Father Secchi, the former director of the Collegio Romano Observatory, has been erected at Regio, where he was born, at a cost of 78,000 fr., which was collected by subscription.

WE regret to notice the deaths of two English naturalists, Mr. Arthur Dowsett, who died on November 6th, and Mr. David Robertson, who died on November 20th. Dr. G. Carton, the archæologist, died recently at Thielt, Belgium.

AT the annual meeting of the Edinburgh Royal Society, Lord Kelvin was elected President, and Prof. James Geikie, Lord McLaren, The Rev. Prof. Flint, Prof. J. G. McKendrick, Prof. Chrystal and Sir Arthur Mitchell were elected Vice-Presidents.

PROF. N. W. SKLIFOSOVSKY has been appointed President and Prof. J. T. Klein, Vice-President of the Organizing Committee of

the International Medical Congress, 1897, and Prof. W. K. Roth has been appointed General Secretary in the room of Prof. Erisman, to whose enforced retirement from the University of Moscow we have recently called attention.

THE section of Mineralogy, of the Paris Academy of Sciences, has proposed as candidates for the vacancy caused by the death of M. Daubrée, MM. Michel Lévy, de Lapparent, Barrois and Douvillé. The names are arranged in the order of the preference of the section.

It is reported by telegram from Cape Town that Dr. Edington has discovered the microbe of rinderpest, but no details have as yet been received.

DR. HUGO DE VRIES has been appointed director of the botanical gardens at Amsterdam in the place of Dr. Oudemans. Dr. J. de Winter, assistant in the zoological garden at Antwerp, has been made director of the zoological garden at Giseh, near Cairo.

AN international botanical garden is to be established at Palermo, under the direction of Prof. Borzi, of the University. It is hoped that the favorable position of the garden may attract foreign students.

THE concluding parts of v. Helmholtz's great work, *Handbuch der Physiologischen Optik*, have now been published by Leopold Voss, Leipzig and Hamburg. The four last parts, extending the volume to 1334 pages, contain only eleven pages of text and consist chiefly of an elaborate bibliography of physiological optics compiled by Prof. Arthur König.

THE London *Academy* is greatly changed with the issue of November 14th. Mr. Lewis Hind becomes editor, signed reviews are abandoned and portraits are added. We are informed that the journal will hereafter be largely devoted to scientific discussions and announcements.

AT the beginning of 1897 a new monthly journal devoted to the nervous system and its diseases, *Monatschrift für Psychiatrie und Neurologie*, will be published at Berlin. It will be edited by Prof. Wernicke, of Breslau and Prof. Ziehen, of Jena.

ACCORDING to *The British Medical Journal*, on the suggestion of Dr. Nicholson, professor of natural history at the University, the Town Council of Aberdeen agreed some time ago to utilize part of the buildings of the old bathing station as a marine aquarium. The tanks have been made, and the further necessary fittings are in hand. In view of the great importance of the fishing trade at Aberdeen further developments have been contemplated with regard to combining a department for fish hatching and culture on a scientific basis with the aquarium. It is to be expected that the investigations carried on in such an institution should prove of great interest and importance to the students of zoology at the University.

*Garden and Forest* states that the crown forests of Sweden comprise more than one-quarter of the entire wooded area of the country and are managed with scrupulous care. The increase alone is cut, so that a productive forest is to stand forever on all crown lands that are unsuitable for cultivation. More than this, the government has entered upon an extensive system of planting trees on desolate and uncultivated areas, and these object-lessons have induced owners of private forests, especially the larger proprietors, to manage their timber lands so that they will become permanent sources of income. These facts were communicated to our Department of State by Hon. H. W. Thomas, United States Minister to Sweden, and they are of particular interest, not only to Sweden, but also to the United States and to Canada, whose lumber meets the Swedish product as its greatest competitor in the markets of the world. Since the forests in Sweden grow slowly, it has generally been supposed that the immense quantities exported would gradually exhaust this most important source of the nation's wealth, but from the facts stated it appears probable that the forty-seven million acres of forests in the country will continue to be a source of income for all future time. The products of the forest now comprise nearly one-half of the total exports of the country in value.

*The British Medical Journal* states that the German Medical Press Association held its annual meeting recently at Frankfort-on-Main,

under the presidency of Dr. Adler, of Vienna. The following medical journalists were elected members of the committee for the ensuing year: Dr. Adler, of the *Wiener medizinische Wochenschrift*; Prof. Ewald, of the *Berliner klinische Wochenschrift*; Dr. Honigmann, of the *Zeitschrift für praktische Aerzte*, and Docent Dr. Mendelsohn, of the *Zeitschrift für Krankenpflege*. The number of members of the Association is now 39, representing 37 journals. Prof. Virchow was elected an honorary member of the Association, and in acknowledging the honor conferred on him recalled the fact that he had been a member of the German Association of Scientists for 50 years, and during all that time he had been editor of its *Archives*.

#### UNIVERSITY AND EDUCATIONAL NEWS.

THE will of the late Willard B. Perkins leaves, among other public bequests, \$24,000 to Colorado College, and \$6,000 each to Columbia University and the Massachusetts' Institute of Technology, for travelling scholarships in architecture.

THE University of Helsingfors has received by the will of the late Dr. H. F. Antells 800,000 M., the interest of which is to be used for travelling scholarships and scientific expeditions.

DR. WILLIS GREEN CRAIG has been elected President of Center College, at Danville, Ky.

DR. PEITHNER v. LICHTENFELS, of the Polytechnic Institute at Graz, has been promoted to a full professorship of mathematics. Dr. Edler, of Göttingen, has been called to an associate professorship of agriculture at the University of Jena; Dr. E. Pringsheim, docent in physics, and Dr. Karl Friedheim, docent in chemistry, have been appointed to professorships in the University at Berlin.

#### DISCUSSION AND CORRESPONDENCE.

##### AGE OF THE POTOMAC FORMATION.

TO THE EDITOR OF SCIENCE: In the last number of SCIENCE, Prof. Marsh tells us that the vertebrate fossils of the Potomac formation demonstrate its Jurassic age. This is a matter of much interest, because the evidence from fossil plants has been thought to place the for-